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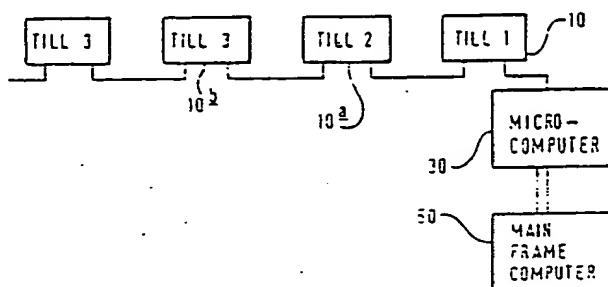
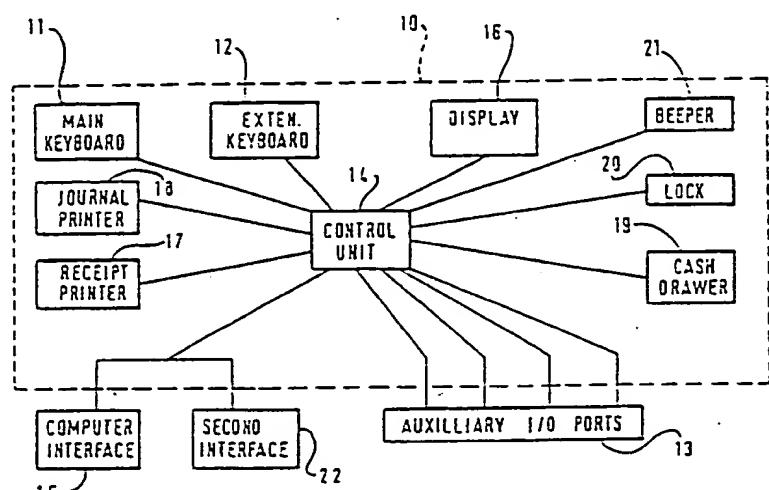
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: TILL REGISTER

(57) Abstract

A till register (10) comprises essentially a combination of cash drawer (19) and computer terminal whereby all calculations are performed by a computer (30) remote from the till register and information displayed on a display unit (16) or printed by a printer (17, 18) incorporated in the till register is controlled by the remote computer. Opening of the cash drawer is also controlled by the remote computer. Several of such till registers (10, 10a, 10b) may be linked together and connected to the remote computer on a single line to form a complete installation. The remote computer may comprise a mini- or micro-computer itself connected to a further, for example main frame, computer (50).



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Title: Till Register.

Description of Invention.

This invention relates to a till register and a computer installation including a plurality of such till registers.

Installations are currently known in which a central computer is linked to several till registers remote therefrom in such a manner as to perform a stock control or auditing function from product information applied to a terminal incorporated in each till register. In use, a product identification code is fed into the terminal and this information is relayed to the central computer. In some cases, the till register, using its own internal intelligence, simultaneously determines the price of the product and shows this on a display or print out, or in other cases such price information may have to be separately applied to the till register by the operator. In either case the till register itself performs internally the necessary calculation functions to produce a total and usually also indicate cash tendered and change required. The various operations which thus have to be performed on the information applied to the till register terminal requires the provision of significant electronics in each till register and hence such till registers are comparatively costly.

In accordance with the present invention, we provide a till register comprising in combination a cash drawer, means for receiving product identification information, means for transmitting and receiving information whereby such product identification information may be transmitted to a remote computer which is programmed to accept

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such information and to derive therefrom corresponding price information and to total such price information in a single transaction and to transmit such price and total information back to the till register, and means 5 responsive to information from the remote computer for displaying such information at the till register.

The product identification information may be applied by means of a manually operable keyboard, and/or by means of any appropriate form of reader for 10 recognising data presented in various forms, such as in magnetic ink characters, optical characters, optical bar codes, bar codes, magnetic strips on credit cards or the like, holographic optical hologram messages and so forth.

15 The price information may be displayed on any appropriate visual display unit and/or a print-out facility. Additionally such display unit and/or print-out may handle product identification information in alpha-numeric characters.

20 Whilst the till register may also be provided with facilities for recording other information such as date and the identity of the till operator, it is essentially 'non-intelligent' and all calculations and other operations requiring computer intelligence are performed 25 by the external computer which can readily service several such till registers.

The invention also resides in a computer installation comprising a plurality of such till registers linked to a single computer. In a typical installation 30 the computer may be a micro- or mini-computer handling all till registers on the premises, and it may in turn be linked to a central, e.g. main frame, computer located at a regional head-quarters whereby stock control information derived by the micro- or mini-computers from input from all the tills at various premises is transmitted 35 to the main frame computer, which may itself be programmed for ordering and despatching replacement stock as necessary.

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The invention will now be described by way of example with reference to one embodiment of till as illustrated in the accompanying drawings wherein:-

5 FIGURE 1 shows a block schematic diagram, including various optional features, of a till register in accordance with the invention;

FIGURE 2 shows a main keyboard incorporated in such till register;

10 FIGURE 3 is a diagram showing how said till register may be operated in conjunction with remote micro-computer and optionally a further main frame computer; and

FIGURE 4 is a flow chart representing a typical operating program.

15 A till register 10 in accordance with the invention has provision for product identification input which may take the form of a main keyboard 11, and optional extension keyboard 12, or any of a plurality of auxiliary input/output ports 13 where such are provided. Such product identification information is fed through the 20 intermediary of a control unit 14 to a computer interface 15 to which is connected a remote computer, such as the micro-computer 30 indicated in Figure 3.

25 The remote computer 30 is programmed to derive the corresponding price information from the product identification information and transmit this by way of the interface 15 back to the till register for display.

30 The price information supplied from the remote computer is fed by the control unit 14 to an output device in the form of a display unit 16, a receipt printer 17 or a journal printer 18.

Thus, the output device or devices incorporated in the till register 10 are driven by the remote computer 30 and not by any internal intelligence provided within the till 10 itself.

35 Additionally, the till incorporates a cash drawer 19 and authorisation lock 20. An audible device or "beeper" 21 may also be provided to give an audible indication of certain operations.

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Additionally, a second interface 22 may be provided for enabling several such till registers, as hereinafter described, to be used on a single port of the remote computer.

5 The main keyboard 11, extension keyboard 12 (where provided), authorisation lock 20 and auxiliary input/output ports 13 are sources of data which is received and buffered by the control unit 14 and transmitted to the remote computer over the computer interface 10 15.

15 Data received from the remote computer over the computer interface 15 is buffered and interpreted by the control unit 14 and then sent to one or more of the display units 16, receipt printer 17, journal printer 18, cash drawer 19, auxiliary input/output ports 13 and beeper 21 as appropriate.

20 The main keyboard 11, as shown in Figure 2, consists of 23 input keys, each of which causes a single character code to be generated when it is pressed, the beeper 21 preferably being activated to confirm operation of each key.

25 As can be seen, the keys of the main keyboard 11 include a block of numerical keys as well as various control keys and keys for the input of additional information.

30 A coded product identification number may be entered on the main keyboard, but the till may also be equipped with a bar code reader or the like, connected to one of the ports 13 so as to obtain the required product identification information directly from the product.

35 If provision is required for additional information, the extension keyboard 12, which is preferably provided in the form of a plug-in module, can be employed for this purpose. Thus for example, one form of extension keyboard may include a block of typically 96 keys which are individually programmable by the remote computer to represent specific items. These might be

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used to represent various beverages, sandwiches and other foods where the till register is to be used in a self-service restaurant or a public house bar.

5 Alternatively, an extension keyboard may take the form of a standard alphanumeric typewriter set of keys. In such a case, the remote computer could be programmed to identify products or services by name.

10 Whilst such an extension keyboard could be provided as a plug-in option for use in addition to the main keyboard 11, it will be appreciated that the keys required for the main keyboard could be themselves provided as a plug-in unit, the extension keyboards then also incorporating a main keyboard key block.

15 Thus in one particularly convenient practical embodiment, the till register could afford a main body with space for the reception of any one of a number of keyboard units, all of modular construction so as to be interchangeable within the body.

20 The authorisation lock 20 is operated by a key which is inserted by the operator before starting to use the till. When this key is inserted in the lock, a control code is generated. Likewise when the key is removed from the lock, another control code is generated, such control codes being fed to the remote computer.

25 The display unit 16 preferably includes two separate display screens facing in opposite directions, each of which is arranged to display the same information. The display screens may use LEDs or gas discharge display elements for displaying required information in the appropriate characters. Alternatively, a cathode ray tube display unit may be provided as a plug-in module.

30 The journal printer 18 preferably consists of a 40 column printer, using the same character set as the display unit and is preferably arranged to print out a complete record of all information shown by the display unit whilst the till is in operation.



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The receipt printer 17 is similar in nature to the journal printer, but can be operated independently and prints out only selected information as required to be shown on a receipt.

5 The journal printer and receipt printer may both be provided as plug-in modules.

The cash drawer 19 is opened only under the control of the remote computer when the appropriate code is received. It is closed manually and automatically 10 latches shut until again released by the remote computer. However, a manual override lock may be provided on the cash drawer for use in the event of electrical failure.

15 The state of the cash drawer, whether open or closed, and also the state of the authorisation lock 20 may be examined on request by the remote computer, and in this case the control unit sends back to the remote computer appropriate report signals.

The provision of the second interface 22 in the till register 10 effectively allows several such till 20 registers 10a, 10b to be connected to the remote computer by a single line from only one of them. All data received on the computer interface 15 is immediately transmitted on the second interface 22, without buffering, and likewise all data received on the second 25 interface 22 is immediately transmitted on the computer interface 15, without buffering.

30 The auxiliary input/output ports 13 allow various optional equipment to be used with the till, such a bar code reader, magnetic card reader, automatic weighing machine, and automatic change dispensing machine.

The control unit 14 controls the operation of the other functional units of the till. It buffers data to and from the remote computer and controls the routing of data to and from the various input/output devices, such 35 as the keyboards, display unit, printers etc.

Since the control unit will incorporate only a relatively small RAM memory for such buffering function,

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it is also arranged in known manner to generate and transmit a signal to the remote computer when the buffer is almost full. The remote computer is accordingly programmed to respond to the signal and to cease 5 transmission to the till until the latter sends a further signal indicating that transmission may be resumed.

Data entered on the keyboards or other input device is buffered by the control unit and transmitted to the remote computer as soon as possible.

10 However, where several such tills are being used simultaneously on a single line, by linking them together through the respective second interfaces, each till register is given its own code number, and the remote computer is programmed to select only one such till at a 15 time by sending out a till-select code corresponding to that till register, the till register then communicating with the remote computer until a different till-select code is sent out.

20 During the time that any particular till register is selected by receipt of its own till-select code from the remote computer, it may transmit any data from the keyboards or other input devices to the remote computer. When all of the currently available data has been transmitted, an end-of-transmission code is transmitted, 25 and the remote computer is programmed so as not to select a different till until it has received this code.

Whilst the control unit 14 is, as mentioned above, responsible for the routing of data to and from the various input and output devices, output to the display 30 unit, the printers and the auxiliary input/output ports is controlled by codes transmitted to the till register by the remote computer.

The various control codes operative between the till register and the remote computer are, in summary, as 35 follows:-

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1. Control codes received from the remote computer.

Select till No. 0-9.

Select display.

5 Deselect display.

Select journal printer.

Deselect journal printer.

Select receipt printer.

Deselect receipt printer.

10 Select auxiliary input/output port No. 1-4.

Open cash drawer.

Examine lock and cash drawer.

2. Control codes transmitted to the remote computer.

15 Computer should cease transmission.

Computer may resume transmission.

Start data from auxiliary input/output port No. 1 - 4.

End data from auxiliary input/output ports.

20 Key in lock.

Key not in lock.

Cash drawer open.

Cash drawer closed.

End of transmission.

25 All data and control codes can be presented in the form of internationally recognised character codes.

Referring now to Figure 4, a typical operating programme includes three main portions namely:

- 30 A. an initial or control portion;
- B. a price identification and totalling portion;
- C. a payment portion.

35 The initial or control portion A provides an internal systems check when the till register is initially switched on. In the event of a system error, such as failure to establish a link with the remote computer, or an inoperative accessory unit, an appropriate error report can be displayed on the display

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unit. When such error is rectified, or if the systems check is completed satisfactorily, the till register can then be placed into any one of several different modes, and information relative to the choice of modes can be 5 shown on the display unit. In a typical case as illustrated, four such modes are provided for, namely an "X read" mode, an "end" mode, a "returns" mode and a "transact" mode.

When the "X read" mode is selected this results in 10 an instruction to the remote computer to provide a print-out of all transactions recorded by the till register since the beginning of operations, and the remote computer provides the required information and causes the control unit to route such information to the journal 15 printer.

If the "end" mode is selected, a similar print-out of an entire days transactions is produced before the till register is switched off.

If the "returns" mode is selected, this sends a 20 control code to the remote computer for the purpose of authorising a refund and identifying the returned item in the next portion of the programme.

Finally, when the "transact" mode is selected, the till register can then be used to determine and total 25 prices.

In this portion of a typical programme, as illustrated in Figure 4, the display unit may initially ask the operator to enter an authorisation number, which may be done either manually on the keyboard, or for 30 example by means of a magnetic card reader. This information is checked by the remote computer to determine whether the entered number is valid, and if so the display unit then shows a request for the entry of a product number. Again, such information may be entered 35 manually on the keyboard, or by means an appropriate reader. The number is then shown on the display unit, followed by an identification of the relevant product as

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determined by the external computer. If this information is correct, the number of such items can then be entered, and this information will be processed by the remote computer to give a display showing the "extended" price, 5. that is to say the total cost of the indicated number of the items under consideration.

When the operator is satisfied that all the displayed information is correct, the "enter" button on the keyboard can be operated to cause the corresponding 10 entry to be printed and remembered by the external computer.

After one or more such series of entries, the "total" button can be operated, whereupon the remote computer will calculate the total cost of the transaction 15 and display this information on the display unit.

The final portion of the programme enables payment to be effected in various ways, selected by operation of the appropriate key on the keyboard.

If payment by cheque is required, the appropriate 20 button is pressed and this causes the remote computer to enter on the display unit a request for appropriate verification information, such as the purchaser's cheque card number.

Likewise, if payment by credit card is selected the 25 external computer asks for the appropriate information in this case also.

Alternatively, the transaction could similarly be charged to a customer's account after verification by the remote computer, including if necessary a credit check. 30

In all such cases the appropriate information may be applied by means of a magnetic card reader where appropriate,

When payment by any of these methods is admitted, the remote computer will cause the receipt printer to 35 print out the required full receipt.

On the other hand, if payment by cash is selected, information as to the amount tendered is fed to the

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remote computer, which in turn causes the display unit to show the amount of change required, and may simultaneously operate any change dispenser which may be connected to the till register on of the auxiliary 5 input/output ports 13. In this case also, a receipt will be printed as required.

It will be appreciated that at various stages during this operation, the operator may wish to cancel an entry, and as can be seen from Figure 4, the programme has 10 provision for this.

The remote computer can service all the till registers of a particular establishment in which it is installed and also perform a stock control operation. In particular, the remote computer can continuously monitor 15 the rate of transactions being carried out, either as a whole, or in relation to individual lines of merchandise, so that management can, for example, at any time introduce a price variation in relation to a particular line without the need for each till to be re-programmed 20 individually.

Where several such establishments are operated by a single concern, as for example a chain of supermarkets, the computer in each establishment can be linked by any suitable means to a central main frame computer indicated 25 at 50 for the transmission of stock control or other information either continuously or on demand. However, the till register 10 may be operated either with only a local micro- or mini-computer 30 or alternatively by direct access to a main frame computer 50 without the 30 intermediary of micro- or mini-computers if required.

The system is also suitable for use in counter-service establishments, and especially in public houses where the prices of drinks may vary between different bars. The tills in the latter case may have an 35 appropriate alpha-numeric keyboard for product identification information and the price as determined by the remote computer will be determined by reference to the

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particular till register according to its location, so that operators may be transferred between different bars according to demand without having to remember various different tariffs.

5 In the case of drinks dispensed mechanically, by means of pump or optics, the latter may themselves incorporate means for generating product information and applying it directly either to the remote computer or to the till through one of the input/output ports. Thus, 10 for example, each time the particular optic is operated, the appropriate input may be applied to the product identification file within the computer and then transmitted to the till.

15 Additionally, by making provision for identification of individual operators, several operators may use the same till register simultaneously. The remote computer can be programmed to keep separate sub totals for each operator if an operator code is supplied with each item of product information.

20 It will thus be appreciated that the till register in accordance with the invention is, in essence, a combination of cash drawer and computer terminal. This provides for a greater degree of flexibility in operation as compared with existing computer linked till systems 25 wherein the tills themselves are "intelligent". In the case of the present invention, even access to the cash drawer may be controlled by the external computer, so that in an emergency, such as an attempted robbery, all tills could be locked simultaneously in response to the 30 operation of a single alarm signal.

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CLAIMS:-

1. A till register comprising in combination a cash drawer, means for receiving product identification information, means for transmitting and receiving information whereby such product identification information may be transmitted to a remote computer which is programmed to accept such information and to derive therefrom corresponding price information and to total such price information in a single transaction and to transmit such price and total information back to the till, and means responsive to information from the remote computer for displaying such information at the till register.
2. A till register according to Claim 1 wherein the means for receiving product identification information includes a manually operable keyboard.
3. A till register according to Claim 1 or Claim 2 wherein the means for receiving product identification information comprises a reader responsive to data presented in magnetic, optical, or other coded forms.
4. A till register according to any one of the preceding claims wherein the means for displaying information received from the remote computer comprises a visual display unit.
5. A till register according to any one of the preceding claims wherein the means for displaying information received from the remote computer comprises a printer.
6. A till register according to any one of the preceding claims wherein the cash drawer is openable under the control of the remote computer.

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7. A computer installation comprising a till as claimed in any one of the preceding claims operatively linked to a remote computer.
8. A computer installation comprising a plurality of 5 tills as claimed in any one of Claims 1 to 6 operatively linked to a single remote computer.
9. A computer installation according to Claim 7. or Claim 8 wherein the remote computer is itself operatively linked to a further computer.
10. 10. A till register according to Claim 1 substantially as hereinbefore described.

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FIG 1

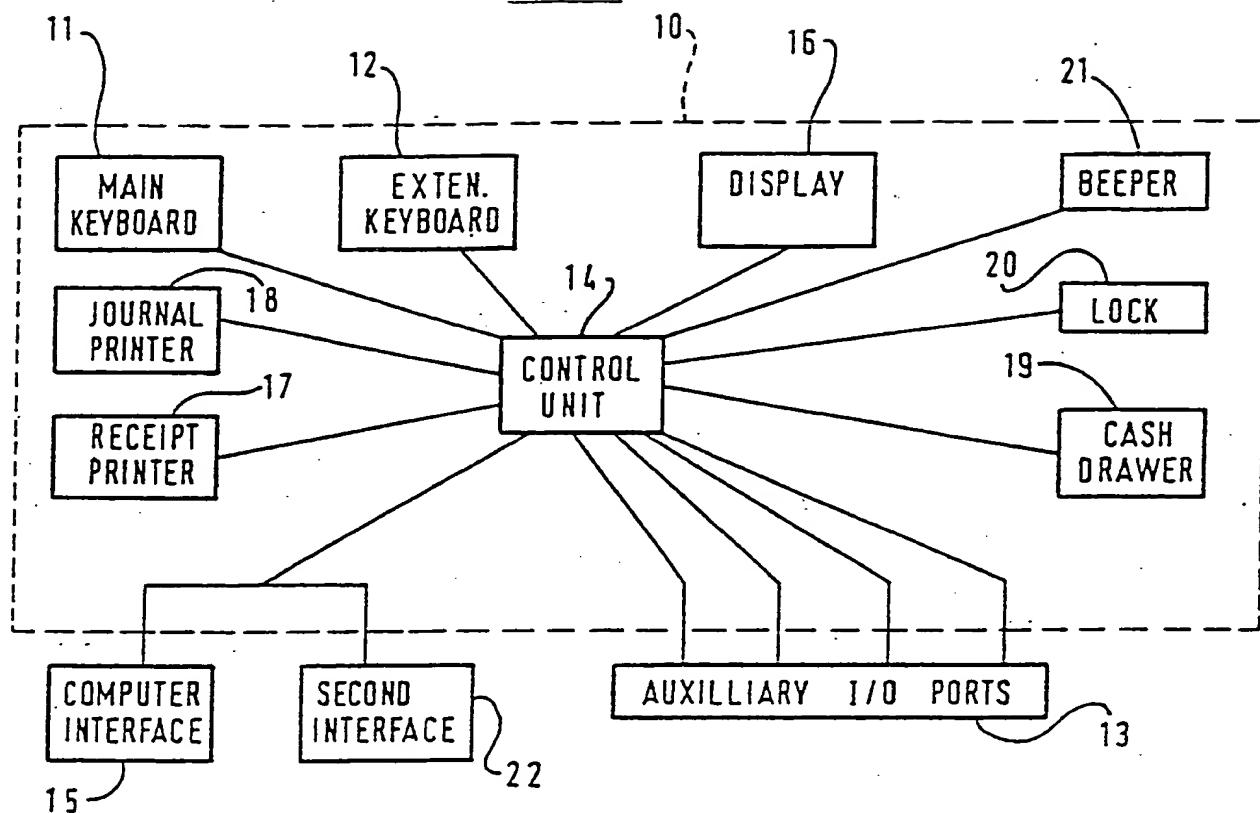
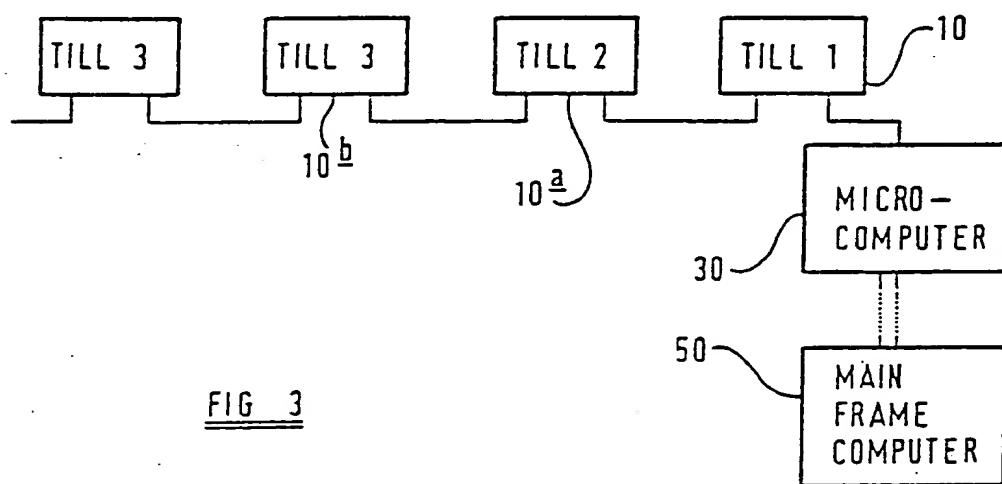


FIG 3



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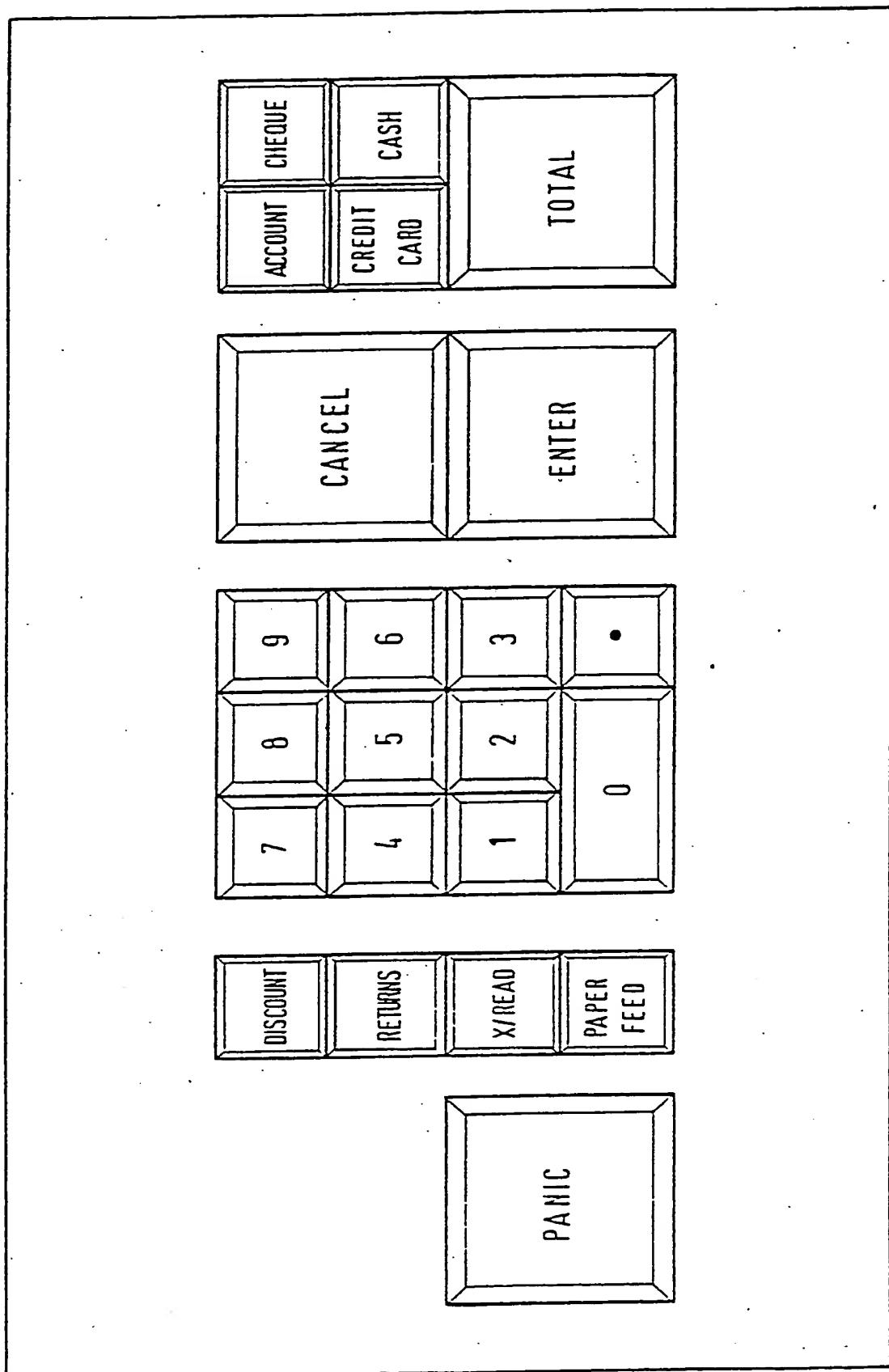
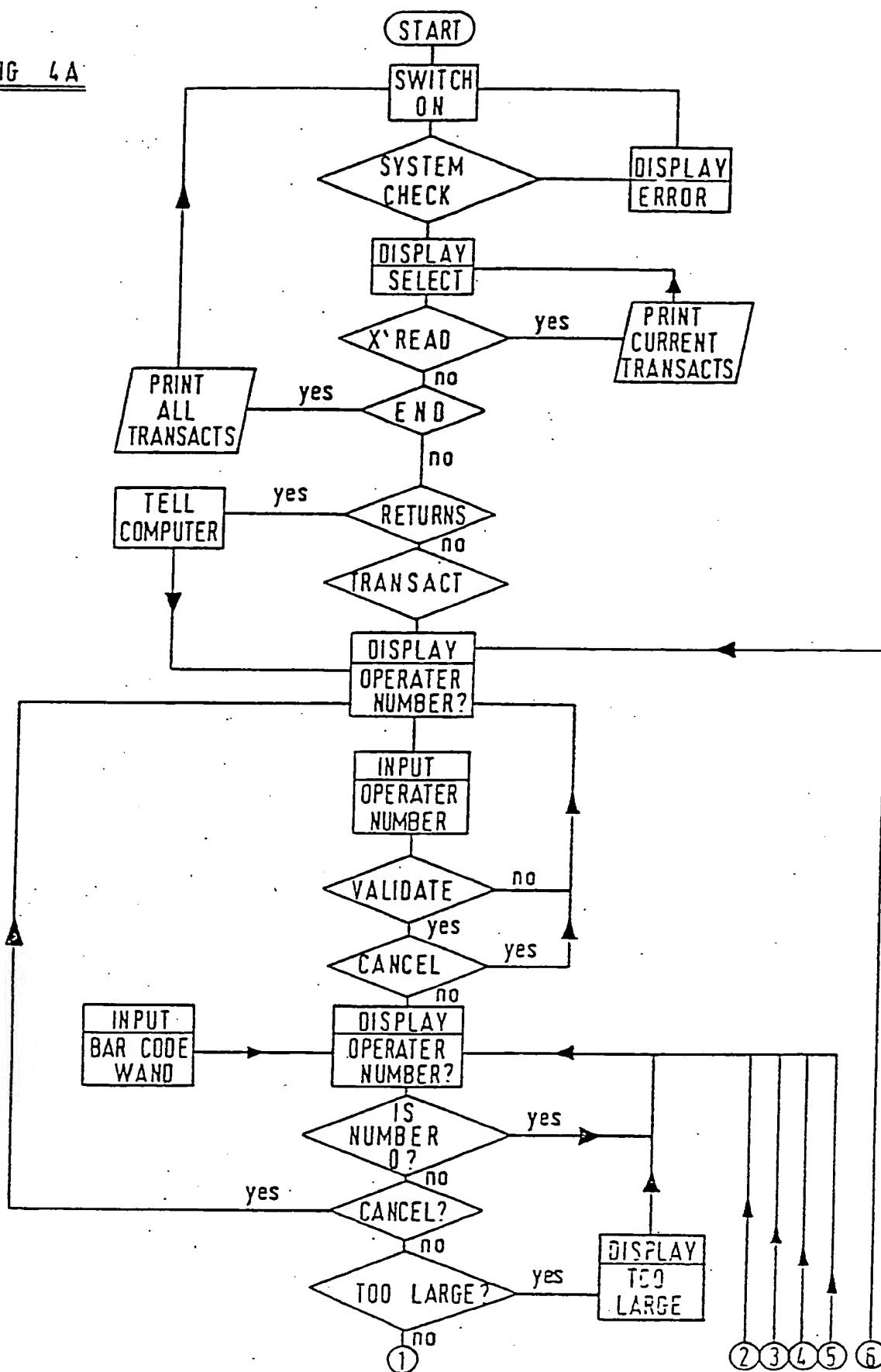


FIG 2

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FIG 4A



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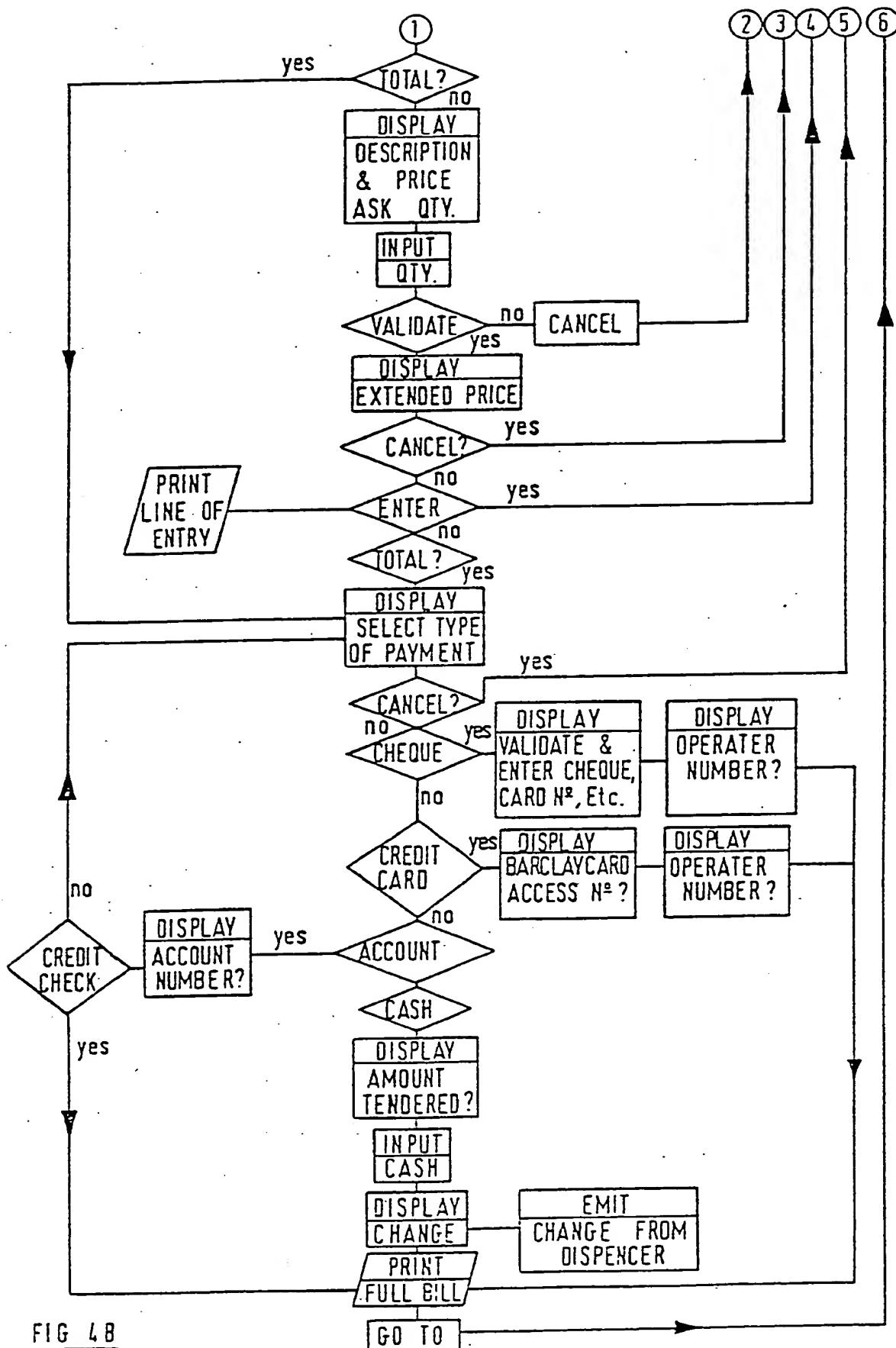


FIG 4B

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INTERNATIONAL SEARCH REPORT

International Application No. PCT/GB 81/00233

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC³: G 06 F 15/24

II. FIELDS SEARCHED

Minimum Documentation Searched ⁴

Classification System	Classification Symbols
IPC ³	G 06 F 15/24
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵	

III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴

Category ¹⁵	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
X	US, A, 3899775 (LARSEN) 12 August 1975 see column 1, line 60 to column 2, line 27; column 3, lines 24-31; column 4, lines 40-48; column 5, lines 19-53; figures 1-3 --	1, 2, 4-8
X	Data Processing, volume 13, no. 13, issued July/August 1971 (London, GB) "SWEDA 700", pages 266-267, see page 266, right-hand column, lines 11-62; page 267, left-hand column, line 22 -----	1, 2, 4, 7, 8

* Special categories of cited documents: ¹⁹

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- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search ²⁰

3rd February 1982

Date of Mailing of this International Search Report ²¹

16th February 1982

International Searching Authority ²²

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